The influence of social context on 4-month-olds’ categorization of infant-directed speech

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Abstract
The present study explored the impact of social context on 4-month-old infants’ (n=51) categorization of approving and comforting infant-directed speech (IDS). Four-month-old heard either approving or comforting IDS during an infant-controlled habituation procedure while viewing one of 3 visual stimuli: a female face, male face, or scrambled face. Faces and a scrambled face were used to test the hypothesis that faces impact infants’ processing of IDS. The female face was used as in the original study (Spence et al., 2004). A main effect of condition preserves social context, while a scrambled female face condition maintains the features of the face, but removes social and familiar factors.

Introduction
Infant-directed speech (IDS) may communicate speakers’ affect and emotion to infants:
• Adults vary IDS prosody as a function of context & intent: (Fernald, 1992; Papek et al., 1991; Stern et al., 1982)
• IDS regulates infant affect & behavior: (Casper & Ahmad, 1990; Fernald, 1993; Pegg et al., 1992)
• Previous studies have found that 6-month-olds, but not 4-month-olds, categorized approving and comforting IDS heard while viewing a nonsocial, checkerboard stimulus: (Moore, Spence, & Katz, 1997; Spence & Moore, 2003)
• BUT 4-month-olds categorized IDS while viewing a female face: (Science, Chuang, & Sokolov, 2004)
• Why does the face aid in IDS processing?
• Facial primes infants processing of vocal accent:
• The face serves as a “setting for attending to the affective quality of the voice.” (Walker-Andrews & Lennon, 1991, p. 140)
• Faces and voices may need to be paired to allow infants to discriminate vocal expressions: (O’Entremont & Muir, 1999)
• Maybe the social context of faces facilitates categorization of infant-directed speech.

Purpose
This experiment tested if the social context of the face aided four-month-olds’ categorization of approving and comforting IDS.

During the categorization task:
• Infants first habituated to multiple stimuli from one IDS category.
• Presented one facial stimulus that accompanied vocal stimuli.
• Infants tested with 2 novel IDS stimuli from familiarized category followed by 2 IDS stimuli from novel category.

Methods

- Approving IDS:
  - High mean FO
  - High mean FO variability
  - High-shaped frequency contours

- Approving FO:
  - Low mean FO
  - Low FO variability
  - Falling frequency contours

- Comforting IDS:
  - Low mean FO
  - Low FO variability
  - Falling frequency contours

Participants
- N=53
- Mean age: 125 days (98-149 days)
- 27 males, 26 females

Auditory Stimuli
- Categorization task: 8 approving & 8 comforting IDS stimuli
- Stimuli produced by multiple talkers
- See Moore, Spence, & Katz, 1997 for detailed information

Visual Stimuli
- Each infant received one of 3 facial stimuli.
- Facial stimulus was presented along with auditory stimulus contingent on infant looking.

Procedure
- Habituated to approvals or comforts
- Infant controlled procedure: 6-21 habituation trials
- Habituation criterion: 3 consecutive trials decreased 50% below 1st 3 trials of habituation
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- Four test trials:
  - Within-category test trials: 2 novel IDS stimuli from the familiar IDS category
  - Between-category test trials: 2 IDS stimuli from the novel IDS category

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Results

ANALYSIS:
- Trial Block (Last Habituation, Within-Category Test Trials, Between-Category Test Trials) x IDS Condition (Approving, Comforting) x Facial Stimuli Condition (Female, Scrambled, Male)
- Dependent measure: Mean fixation time
- No main effects or interactions

Planned Pair-Wise Comparisons:
- Female Face: N=19
  - Approval Condition (N=10)
  - No significant differences
  - Comfort Condition (N=9)
  - No significant differences
- Within-Category Test Trials & Between Category Tests: Mdiff = -3.33, SE = 1.52, p = .05
- Scrambled Face: N=16
  - No significant differences
- Female Face: N=18
  - No significant differences
- Male Face: N=18
  - No significant differences

Discussion
Asymmetrical categorization in female condition due to more variability in approval stimuli than comfort stimuli.

Queen, 2002.

4-month-olds’ processing of male and scrambled faces differs from female face processing.

Kaneske, Langlois & Marti, 2005,
Scrambled faces do not provide perceptual information specific to faces, and are not seen as a “face.”

Turati, Valenza, Leo, & Simon, 2005.

Data collection is ongoing, but social context of female face seems to be facilitating infants’ categorization.